Claims

Sub A1

1. An optical device for producing a polarisation rotation of an optical signal, the device comprising:

a birefringent material for, in use, splitting the optical signal into two orthogonal polarisation component signals;

a polarisation rotating means for, in use, rotating each polarisation component signal by a predetermined amount, and wherein the device is arranged in a manner such that, in use, the two rotated polarisation component signals are being combined by way of the birefringent material for providing the predetermined polarisation rotated optical signal.

2. An optical device as claimed in claim 1 wherein said polarisation rotation is by 90 degrees.

3. An optical device as claimed in claim 1 wherein the polarisation rotating means comprises a nominally 45° Faraday rotator and an optical circuit arranged in a manner such that, in use, the polarisation component signals are being transmitted twice through the nominally 45° Faraday rotator.

4. An optical device as claimed in claim 3 wherein the optical circuit comprises a lens and a reflective element.

5. An optical device as claimed in claim 1 wherein the birefringent material comprises rutile.

6. An optical device as claimed in claim 1 further comprising:

coupling means for, in use, coupling the optical signal into the device from an optical fibre and coupling the 90° polarisation rotated optical signal back into the optical fibre.

7. A method for producing a predetermined polarisation rotations of an optical signal, the method comprising the steps of:

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(a) splitting the optical signal into two orthogonal polarisation component signals utilising a birefringent material;

(b) rotating each polarisation component signal by nominally predetermined polarisation rotation utilising a polarisation rotation means; and

(c) combining the two rotated polarisation component signals utilising the birefringent material.

8. A method as claimed in claim 7 wherein said predetermined polarisation rotation comprises a 90 degree polarisation.

9. A method as claimed in claim 7 wherein said rotating step comprises:

rotating each polarisation component signal comprises utilising a nominally 45° Faraday rotator and an optical circuit arranged in a manner such that, in use, the polarisation component signals are being transmitted twice through the nominally 45° Faraday rotator.

10. A method as claimed in claim 9 wherein said optical circuit comprises a lens and a reflective element.

11. A method as claimed in claim 7 wherein the birefringent material comprises rutile.

12. A method as claimed in claim 7 wherein said method further comprises the steps of coupling the optical signal into the device from an optical fibre, and coupling the rotated optical signal back into the optical fibre.

13. A optical telecommunications system including an optical device for producing a polarisation rotation of an optical signal transmitted by said system, the device comprising:

a birefringent material for, in use, splitting the optical signal into two orthogonal polarisation component signals;

a polarisation rotating means for, in use, rotating each polarisation component signal by a predetermined amount, and wherein the device is arranged in a manner such that, in use, the two

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rotated polarisation component signals are being combined by way of the birefringent material for providing the predetermined polarisation rotated optical signal.